

Automate Systems Operation to Reduce Venting



Partner Reported Opportunities (PROs)
for Reducing Methane Emissions

PRO Fact Sheet No. 106

Applicable sector(s):

☐ Production ☐ Processing ☒ Transmission and Distribution

Partners reporting this PRO: Louisville Gas and Electric Company, Natural Gas Pipeline Company (now Kinder Morgan, Inc.)

Other related PROs: Install Electric Compressors, Replace Ignition-Reduce False Starts

Compressors/Engines ☒
Dehydrators ☐
Pipelines ☐
Pneumatics/Controls ☐
Tanks ☐
Valves ☐
Wells ☐
Other ☐

Technology/Practice Overview

Description

Transmission pipelines have multiple compressor stations with five to ten compressors at each station. Where these compressors have older ignition systems, shutdowns and restarts result in blowdown and gas pneumatic starter emissions that release excessive amounts of methane to the atmosphere. Partners reported reducing these emissions by automating reciprocating compressors.

Automatic control systems, such as programmable compressor ignition systems, reduce the number of startups and shutdowns. Programmable Logistic Controllers (PLCs), incorporate features such as unit performance, process calculations, unit load management, independent safety shutdown, and automated backup control. These systems effectively increase the operational efficiency and reliability of the compressor and also reduce methane emissions.

Operating Requirements

An electrical power supply is required to operate the automatic systems.

Applicability

This option is applicable to all electrified transmission stations.

Methane Savings: 20 Mcf per year

Costs

Capital Costs (including installation)

☐ <\$1,000 ☒ \$1,000 – \$10,000 ☐ >\$10,000

Operating and Maintenance Costs (annual)

☐ <\$100 ☒ \$100-\$1,000 ☐ >\$1,000

Payback (Years)

☒ 0–1 ☐ 1–3 ☐ 3–10 ☐ >10

Benefits

Reducing methane emissions was an associated benefit of the project.

Methane Emissions Reductions

The methane emissions savings are based on one transmission compressor blowdown of 15 Mcf per year plus gas vented from a pneumatic starting motor. Based on the handbook, *Pipeline Rules of Thumb* (Sixth Edition, p. 24-15), 0.5 scf of gas per horsepower (HP) at 250 psig must be stored to operate the starting motor. Assuming three attempts for a successful startup, methane emissions from these attempts would be 4.5 Mcf per year. One partner reported methane savings of 11,092 Mcf per year over 3 years for multiple applications.

Economic Analysis

Basis for Costs and Savings

Methane emissions savings of 20 Mcf per year are estimated for a 3,000 HP reciprocating compressor that requires three attempts to start up and one avoidable blowdown per year.

Discussion

This technology typically has a quick payback. The one-time capital cost for installing a PLC on a reciprocating compressor is justified by the lower operation and maintenance costs rather than gas savings. PLCs reduce methane emissions by providing a better service factor and fewer compressor surges, reducing the amount of methane that is vented to the atmosphere.